



# METAL INDUSTRY INDICATORS



August 1997

## Indicators of Domestic Primary Metals, Steel, Aluminum, and Copper Activity

**The latest metal industry leading indexes indicate no changes to the present pattern of slow-to-moderate growth in the U.S. primary metal industries in the near future. The metals price leading index, however, is giving signals of diminishing metal price growth in the months ahead.**

The **primary metals leading index** edged up 0.1% in July, to 125.5 from 125.4 in June. This index is now showing an increase in each of the last 10 months. The index's 6-month smoothed growth rate, a compound annual rate that measures the near-term trend, eased slightly to 5.6% in July from a revised 6.2% in June. A drop of 0.7 hour in the average workweek, the largest 1-month drop for that indicator since May 1989, offset gains in the S&P stock price index for diversified machinery and the Purchasing Managers' Index.

Most of the large drop in the July average workweek is probably due to seasonal effects. The primary metals workweek normally falls in July and an examination of seasonal factors for that data series shows that such declines have been increasing in recent years. Also, the week in which the employment data were collected for July came immediately after the Fourth of July holiday. The average workweek is therefore likely to bounce back from this drop in August. The growth rate of the Journal of Commerce metals price index, the only other component available for July, made a small positive contribution to the leading index.

The 6-month smoothed growth rate of the primary metals leading index remains relatively strong and continues to signal modest growth in the U.S. primary metals industry. A growth rate above +1.0% usually indicates an upward trend in near-term industry activity.

The July primary metals leading index must be considered preliminary because only four of the eight leading indicators were available for its calculation. The index will probably be revised as more information becomes available.

The **steel leading index** increased 0.7% to 104.9 in June, from a revised 104.2 in May. The deflated value of shipments of household appliances, which reached a record high level in June, accounted for nearly all of the increase. The 6-month smoothed

growth rate of the steel leading index continues to point to modest growth in the domestic steel industry.

The **aluminum mill products leading index** slipped 0.1% in June to 143.8 from a revised 144.0 in May, following a similar decrease last month. However, the index's 6-month smoothed growth rate remains relatively high at 3.6%. Commercial and industrial construction contracts had the largest negative impact on the leading index, as that component eased back from its highest level in two years. The aluminum mill products leading index suggests that moderate growth in that industry will continue in the near term.

The **primary and secondary aluminum leading index** rose 1.1% in June to 239.6 from a revised 237.0 in May. Four of the index's six components, the average workweek in primary aluminum establishments, the industrial production index for aluminum mill products, the ratio of shipments to inventories for motor vehicles and parts, and the S&P stock price index for aluminum companies, increased in June. However, the LME spot price for aluminum and the deflated value of new orders for nonferrous and other primary metals were lower. The 6-month smoothed growth rate of the primary and secondary aluminum index registered a robust 7.4% in June, pointing to continued growth in the use of primary and secondary aluminum products. Because many of these products are imported into the United States, domestic aluminum production and shipments will probably continue to grow slowly. (Tables and charts for the primary and secondary aluminum indexes are in a separate file.)

The **June copper leading index** was 123.1, 0.4% higher than May's revised level of 122.6. The index's 6-month smoothed growth rate moved up to 4.0% from a revised 3.5% in May. The growth rate for this index has been 1.0% or higher since February 1996. Only two of the index's six components increased in June. These were average weekly overtime hours worked in rolling and drawing mills and the ratio of shipments to inventories for electronic and other

electrical equipment, which accounted for most of the increase in the leading index.

According to figures from the Federal Reserve Board, the primary copper industry was operating at 97.9% of capacity in June. Although capacity constraints will limit growth in domestic copper activity, the strength of the 6-month smoothed growth rate of the copper leading index suggests that the U.S. copper industry will continue to operate at near 100% of capacity.

### Metals Price Leading Index Posts Third Consecutive Decline

The leading index of metal prices decreased for the third consecutive month in June, moving down 0.4% to 95.1 from a revised 95.5 in May. Its 6-month smoothed growth rate of -0.7% was the lowest growth rate since June 1995. The growth rates of the deflated value of new orders for U.S. nonferrous metals and new

housing units authorized by building permits accounted for all the decrease in the metals price leading index. A small increase in the growth rate of the deflated M2 money supply slightly offset the declines in the other two components. The fourth index component, the growth rate of the Organization for Economic Cooperation and Development total leading index, was not available for the June index calculation.

Another indicator of metal price trends, the growth rate of the deflated value of nonferrous metal products inventories held in the United States increased in June to -4.2% from a revised -4.9% in May. The recent declines in the metals price leading index indicate that metal price growth may slow over the next few months.

It is important to recognize that the business cycle and inventories are only two factors in price determination. Other factors that affect prices include changes in metals production, speculation, strategic stockpiling, and production costs.

**An explanation of the indexes and the 6-month smoothed growth rates appears on page 12.**

**Table 1.**  
**Leading Index of Metal Prices and Growth Rates of the Nonferrous Metals Price Index, Inventories of Nonferrous Metal Products, and Selected Metal Prices**

	Leading Index of Metal Prices (1967=100)	Six-Month Smoothed Growth Rates				
		MII Nonferrous Metals Price Index	U.S. Nonferrous Metal Products Inventories (1982\$)	Primary Aluminum	Primary Copper	Steel Scrap
<b>1996</b>						
June	95.1r	-29.2r	6.6	-21.6	-45.4	-2.2
July	95.2r	-24.1	11.0	-16.6	-39.9	-7.6
August	95.3r	-20.9	10.6	-15.6	-33.3	-5.8
September	94.6r	-26.8	10.9	-23.5	-37.6	-1.3
October	94.6r	-21.1	9.2	-16.6	-31.7	-13.3
November	94.8r	2.1	6.3	-2.8	11.8	-26.3
December	95.0r	-6.9	5.3	-2.0	-11.2	-21.8
<b>1997</b>						
January	95.9r	6.4r	-0.2	9.8	6.6	-6.6
February	96.5r	11.0	-0.9r	12.7	10.5	3.7
March	96.6r	10.4	-3.8	10.1	11.2	-3.3
April	96.2r	9.7	-3.6	10.8	12.2	-8.5
May	95.5r	18.3	-4.9r	11.0	30.7	2.0
June	95.1	15.1r	-4.2	5.1	25.8	3.4
July	NA	16.1	NA	21.0	3.4	11.6
<i>r - Revised</i>						
<b>Note:</b>	The components of the Leading Index of Metal Prices are the 6-month smoothed growth rates of the following: 1, the deflated value of new orders for nonferrous metals; 2, the OECD leading index, total; 3, the index of new private housing units authorized; and 4, the deflated value of U.S. M2 money supply. The Metal Industry Indicators (MII) Nonferrous Metals Price Index measures changes in end-of-the-month prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange (LME). The steel scrap price used is the price of No. 1 heavy melting. Inventories consist of the deflated value of finished goods, work in progress, and raw materials for U.S.-produced nonferrous metals and nonferrous metal products. Six-month smoothed growth rates are based on the ratio of the current month's index or price to its average over the preceding 12 months, expressed at a compound annual rate.					
<b>Sources:</b>	U.S. Geological Survey (USGS); American Metal Market (AMM); the London Metal Exchange (LME); the Bureau of the Census; and the Organization for Economic Cooperation and Development (OECD).					

Link To:

Chart 1.

**Table 2.**  
**The Primary Metals Industry Indexes and Growth Rates**

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
<b>1996</b>				
August	119.7r	1.6r	108.1	3.8
September	119.7r	1.3r	108.3	3.8
October	119.9r	1.5r	109.0	4.5
November	120.2r	1.7r	108.7	3.4
December	121.3r	3.1r	109.0	3.5
<b>1997</b>				
January	121.4r	2.9r	109.1	3.0
February	122.7r	4.2	109.7	3.5
March	123.7	5.3r	109.9r	3.3r
April	124.1r	5.4r	110.5r	3.8r
May	125.3r	6.7r	110.4r	3.1r
June	125.4	6.2r	110.6	2.9
July	125.5	5.6	NA	NA

*r - Revised*

**Note:** Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

**Table 3.**  
**The Contribution of Each Primary Metals Index Component to the Percent Change in the Index from the Previous Month**

<b>Leading Index</b>	<b>June</b>	<b>July</b>
1. Average weekly hours, primary metals (SIC 33)	-0.1r	-1.4
2. S&P stock price index, machinery, diversified	0.4r	0.8
3. Ratio of price to unit labor cost (SIC 33)	-0.1	NA
4. JOC metals price index growth rate	0.0	0.1
5. New orders, primary metals, (SIC 33) 1982\$	0.0	NA
6. Index of new private housing units authorized by permit	-0.1	NA
7. Growth rate of U.S. M2 money supply, 1992\$	0.0	NA
8. Purchasing Managers' Index	-0.1r	0.6
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	0.0	0.1
<b>Coincident Index</b>	<b>May</b>	<b>June</b>
1. Industrial production index, primary metals (SIC 33)	0.4r	-0.1
2. Total employee hours, primary metals (SIC 33)	-0.2r	0.0
3. Value of shipments, primary metals, (SIC 33) 1982\$	-0.3	0.1
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.0r	0.1

**Sources:** Leading: 1, Bureau of Labor Statistics; 2, Standard & Poor's; 3, Center for International Business Cycle Research, Bureau of Labor Statistics, and Federal Reserve Board; 4, Journal of Commerce; 5, Bureau of the Census and U.S. Geological Survey; 6, Bureau of the Census and U.S. Geological Survey; 7, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 8, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey. All series are seasonally adjusted, except 2, 3, and 4 of the leading index.

*NA: Not available      r - Revised*

**Note:** A component's contribution, shown in Tables 3, 5, 7, and 9, measures its effect, in percentage points, on the percent change in the index. Each month, the sum of the contributions plus the trend adjustment equals (except for rounding differences) the index's percent change from the previous month.

Links To:

Chart 2.

Chart 3.

**Table 4.**  
**The Steel Industry Indexes and Growth Rates**

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
<b>1996</b>				
July	102.4r	-0.3r	98.9	2.9
August	102.0r	-1.2r	98.5	1.7
September	101.9r	-1.3r	98.6	1.6
October	101.3r	-2.2r	98.9	2.0
November	102.0r	-0.9r	98.2	0.3
December	102.8r	0.5r	98.7	1.1
<b>1997</b>				
January	103.1r	1.1r	99.3	2.1
February	103.9r	2.4	99.0	1.2
March	104.4r	3.2r	99.3r	1.4r
April	104.2r	2.4	99.7	1.9r
May	104.2r	2.5r	99.6r	1.4r
June	104.9	3.4	99.5	1.1

*r - Revised*

**Note:** Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

**Table 5.**  
**The Contribution of Each Steel Index Component to the Percent Change in the Index from the Previous Month**

<b>Leading Index</b>	<b>May</b>	<b>June</b>
1. Average weekly hours, blast furnaces and basic steel products (SIC 331)	-0.3	-0.1
2. New orders, steel works, blast furnaces, and rolling and finishing mills, 1982\$, (SIC 331)	-0.2	0.1
3. Shipments of household appliances, 1982\$	-0.2	0.5
4. S&P stock price index, steel companies	0.4	0.1
5. Industrial production index for automotive products	0.1	0.1
6. Growth rate of the price of steel scrap (#1 heavy melting, \$/ton)	0.1	0.0
7. Index of new private housing units authorized by permit	0.0	-0.1
8. Growth rate of U.S. M2 money supply, 1992\$	-0.2	0.0
9. Purchasing Managers' Index	0.3	-0.1
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	0.0	0.5
<b>Coincident Index</b>		
1. Industrial production index, basic steel and mill products (SIC 331)	0.5r	-0.4
2. Value of shipments, steel works, blast furnaces, and rolling and finishing mills (SIC 331), 1982\$	-0.3	0.4
3. Total employee hours, blast furnaces and basic steel products (SIC 331)	-0.4	-0.1
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	-0.1r	0.0

**Sources:** Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey; 4, Standard & Poor's; 5, Federal Reserve Board; 6, Journal of Commerce and U.S. Geological Survey; 7, Bureau of the Census and U.S. Geological Survey; 8, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 9, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of the Census and U.S. Geological Survey; 3, Bureau of Labor Statistics and U.S. Geological Survey. All series are seasonally adjusted, except 4 and 6 of the leading index.

*NA: Not available      r - Revised*

Links To:

Chart 4.

Chart 5.

**Table 6.**  
**The Aluminum Mill Products Industry Indexes and Growth Rates**

	<b>Leading Index</b>		<b>Coincident Index</b>	
	<b>(1977 = 100)</b>	<b>Growth Rate</b>	<b>(1977 = 100)</b>	<b>Growth Rate</b>
<b>1996</b>				
July	138.9r	2.1r	123.2	1.5
August	139.1r	1.9r	124.2	3.0
September	140.7r	3.8r	125.4	4.6
October	138.1r	-0.1r	123.8	1.8
November	139.6r	1.8r	124.4	2.5
December	140.3r	2.6r	124.5	2.5
<b>1997</b>				
January	141.4r	3.8r	123.0	-0.2r
February	143.5r	5.9	125.5	3.1r
March	143.2r	4.8r	126.8r	4.6r
April	144.2r	5.4r	125.4r	2.0r
May	144.0r	4.5r	125.4r	1.7r
June	143.8	3.6	126.4	3.0

*r - Revised*

**Note:** Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

**Table 7.**  
**The Contribution of Each Aluminum Mill Products Index Component to the Percent Change in the Index from the Previous Month**

<b>Leading Index</b>	<b>May</b>	<b>June</b>
1. Average weekly hours, aluminum sheet, plate, and foil (SIC 3353)	-0.1	-0.1
2. Index of new private housing units authorized by permit	0.0	-0.1
3. Industrial production index for automotive products	0.2r	0.2
4. Construction contracts, commercial and industrial (square feet)	0.2	-0.3
5. Net new orders for aluminum mill products (pounds)	-0.7r	0.2
6. Growth rate of U.S. M2 money supply, 1992\$	-0.2	0.0
7. Purchasing Managers' Index	0.4	-0.2
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	-0.1	-0.2
<b>Coincident Index</b>		
1. Industrial production index, aluminum sheet, plate, and foil (SIC 3353)	0.6r	0.5
2. Total employee hours, aluminum sheet, plate, and foil (SIC 3353)	-0.3	0.2
3. Shipments of aluminum mill products (pounds)	-0.4r	0.0
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.0r	0.8

**Sources:** Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, Federal Reserve Board; 4, F.W. Dodge, Division of McGraw-Hill Information Systems Company; 5, The Aluminum Association, Inc. and U.S. Geological Survey; 6, Federal Reserve Board, Conference Board, and U.S. Geological Survey; 7, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey; 3, Bureau of the Census and U.S. Geological Survey. All series are seasonally adjusted.

*NA: Not Available      r - Revised*



Links To:

Chart 6.

Chart 7.

**Table 8.**  
**The Copper Industry Indexes and Growth Rates**

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
<b>1996</b>				
July	118.6	1.0	112.9	1.4
August	118.8	1.1	112.3	0.2
September	118.9	1.0	113.8	2.7
October	119.3	1.5	115.1	4.4
November	121.1	4.0	113.3	1.0
December	120.3	2.3	114.4	2.8
<b>1997</b>				
January	120.2	1.8	113.6	1.1
February	122.0	4.1	114.0	1.6
March	123.7	6.3	113.7	0.7
April	121.8	2.6	114.1	1.1
May	122.6r	3.5r	114.1r	0.9r
June	123.1	4.0	114.0	0.5

*r - Revised*

**Note:** Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

**Table 9.**  
**The Contribution of Each Copper Index Component to the Percent Change in the Index from the Previous Month**

Leading Index	May	June
1. Average weekly overtime hours, rolling, drawing, and extruding of copper (SIC 3351)	-0.2	0.3
2. New orders, nonferrous and other primary metals, 1982\$	0.0	-0.3
3. MII stock price index, copper companies	0.3	0.0
4. Ratio of shipments to inventories, electronic and other electrical equipment (SIC 36)	0.1r	0.6
5. Growth rate of the LME spot price of primary copper	0.4	-0.1
6. Index of new private housing units authorized by permit	0.0	-0.1
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	0.6r	0.4
<b>Coincident Index</b>		
1. Industrial production index, primary smelting and refining of copper (SIC 3331)	0.2r	0.0
2. Total employee hours, rolling, drawing, and extruding of copper (SIC 3351)	0.2	0.0
3. Copper refiners' shipments (short tons)	-0.5r	-0.1
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.0r	0.0

**Sources:** Leading: 1, Bureau of Labor Statistics; 2, Bureau of the Census and U.S. Geological Survey; 3, U.S. Geological Survey; 4, Bureau of the Census and U.S. Geological Survey; 5, London Metal Exchange and U.S. Geological Survey; 6, Bureau of the Census and U.S. Geological Survey. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics; 3, American Bureau of Metal Statistics, Inc. and U.S. Geological Survey. All series are seasonally adjusted, except 3 and 5 of the leading index.

*NA: Not available      r - Revised*

Links To:

Chart 8.

Chart 9.

## Explanation

Each month, the U.S. Geological Survey tracks the effects of the business cycle on five U.S. metal industries by calculating and publishing composite indexes of leading and coincident indicators. Wesley Mitchell and Arthur Burns originated the cyclical-indicators approach for the economy as a whole at the National Bureau of Economic Research in the mid-1930's. Over subsequent decades this approach was developed and refined, mostly at the National Bureau, under the leadership of Geoffrey H. Moore.<sup>1</sup>

A business cycle can briefly be described as growth in the level of economic activity followed by a decline succeeded by further growth. These alternating periods of growth and decline do not occur at regular intervals. Composite indexes, however, can help determine when highs and lows in the cycle might occur. A composite index combines cyclical indicators of diverse economic activity into one index, giving decision makers and economists a single measure of how changes in the business cycle are affecting economic activity.

The indicators in the metal industry leading indexes historically give signals several months in advance of major changes in a coincident index, a measure of current metal industry activity. Indicators that make up the leading indexes are, for the most part, measures of anticipations or new commitments to various economic activities that can affect the metal industries in the months ahead.

Composite coincident indexes for the metal industries consist of indicators for production, shipments, and total employee hours worked. As such, the coincident indexes can be regarded as measures of the economic health of the metal industries.

Three of the metal industry coincident indexes, those for primary metals, steel, and aluminum mill products, reflect their classifications in the U.S. Standard Industrial Classification (SIC). The SIC is the main classification used by the United States government and industry in collecting and tabulating economic statistics. Two of the coincident indexes, one for copper and one for primary and secondary aluminum, are blends of two different copper and aluminum industries, respectively.

Of the five metal industries, primary metals is the broadest, consisting of twenty-six different metal processing industries. The steel, aluminum, and copper industries are parts of the primary metals industry.

The metal industry leading indexes turn before their respective coincident indexes an average of 9 months for primary metals, 8 months for steel, and 7 months for copper. The average lead time for the leading indexes of aluminum mill products and primary and secondary aluminum is 6 months.

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<sup>1</sup>**Business Cycle Indicators, A monthly report from The Conference Board** (March 1996).

The leading index of metal prices, also published in the Metal Industry Indicators, is designed to signal changes in a composite index of prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange. On average, this leading index indicates significant changes in price growth about 7 months in advance.

The growth rate used in the Metal Industry Indicators is a 6-month smoothed growth rate at a compound annual rate, calculated from a moving average. Moving averages smooth fluctuations in data over time so that trends can be observed. The 6-month smoothed growth rate is based upon the ratio of the latest monthly value to the preceding 12-month moving average.

$$\left[ \left( \frac{\text{current value}}{\text{preceding 12-month moving average}} \right)^{\frac{12}{6.5}} - 1.0 \right] * 100$$

Because the interval between midpoints of the current month and the preceding 12 months is 6.5 months, the ratio is raised to the 12/6.5 power to derive a compound annual rate.

The growth rates measure the near-term industry trends. They, along with other information about the metal industries and the world economy, are the main tools used to determine the outlook of the industries. A 6-month smoothed growth rate above +1.0% usually means increasing growth; a rate below -1.0% usually means declining growth.

**The next summary is scheduled for release on MINES FaxBack at 10:00 a.m. EDT, Friday, September 19. Access MINES FaxBack from a touch-tone telephone attached to a fax machine by dialing 703-648-4999. The address for Metal Industry Indicators on the World Wide Web is: <http://minerals.er.usgs.gov/minerals/pubs/mii/>**

The **Metal Industry Indicators** is produced at the U.S. Geological Survey by the Minerals Information Team. The report is prepared by Kenneth Beckman (703-648-4916), e-mail ([kbeckman@usgs.gov](mailto:kbeckman@usgs.gov)), and Gail James (703-648-4915), e-mail ([gjames@usgs.gov](mailto:gjames@usgs.gov)). The Center for International Business Cycle Research at Columbia University and the former U.S. Bureau of Mines developed the metal industry leading and coincident indexes. Customers can send mail concerning the Metal Industry Indicators to the following address:

U.S. Geological Survey  
Minerals Information Team  
988 National Center  
Reston, Virginia 20192